

## Refine Search

### Search Results -

Terms	Documents
L1 same (insert\$3 or install\$3)	64

Database:

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L2

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### Search History

 DATE: Tuesday, May 31, 2005   [Printable Copy](#)   [Create Case](#)

<u>Set</u> <u>Name</u> side by side	<u>Query</u>	<u>Hit</u> <u>Count</u>	<u>Set</u> <u>Name</u> result set
	<i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>		
<u>L2</u>	L1 same (insert\$3 or install\$3)	64	<u>L2</u>
<u>L1</u>	(removable or replacable or extractable) same expansion same (module or unit) same portable	150	<u>L1</u>

END OF SEARCH HISTORY

Refine Search

Search Results -

Terms	Documents
L1 same (insert\$3 or install\$3)	0

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Search:

L3

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	<i>DB=EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR</i>		
<u>L3</u>	L1 same (insert\$3 or install\$3)	0	<u>L3</u>
	<i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>		
<u>L2</u>	L1 same (insert\$3 or install\$3)	64	<u>L2</u>
<u>L1</u>	(removable or replacable or extractable) same expansion same (module or unit) same portable	150	<u>L1</u>

END OF SEARCH HISTORY

## Refine Search

### Search Results -

Terms	Documents
(710/301  710/1  710/2  710/300  710/302  710/303  710/304  710/100  710/62  710/72  711/115  361/679  361/680  361/681  361/682  361/683  361/684  361/685  361/686).ccls.	11834

Database:

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 US Patents Full-Text Database  
 US OCR Full-Text Database  
 EPO Abstracts Database  
 JPO Abstracts Database  
 Derwent World Patents Index  
 IBM Technical Disclosure Bulletins

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<u>Set</u> <u>Name</u> side by side	<u>Query</u>	<u>Hit</u> <u>Count</u>	<u>Set</u> <u>Name</u> result set
	<i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>		
<u>L4</u>	710/301,1-2,300-304,100,62,72;361/679-686;711/115.ccls.	11834	<u>L4</u>
	<i>DB=EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR</i>		
<u>L3</u>	L1 same (insert\$3 or install\$3)	0	<u>L3</u>
	<i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>		
<u>L2</u>	L1 same (insert\$3 or install\$3)	64	<u>L2</u>
<u>L1</u>	(removable or replacable or extractable) same expansion same (module or unit) same portable	150	<u>L1</u>

END OF SEARCH HISTORY

Refine Search

Search Results -

Terms	Documents
L2 and L4	14

Database:

- US Pre-Grant Publication Full-Text Database
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- IBM Technical Disclosure Bulletins

Search:

L5

Refine Search

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Clear

Interrupt

Search History

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side

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Count   Set  
Name  
result set

DB=PGPB,USPT,USOC; PLUR=YES; OP=OR

L5   L2 and L4

14   L5

L4   710/301,1-2,300-304,100,62,72;361/679-686;711/115.ccls.

11834   L4

DB=EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR

L3   L1 same (insert\$3 or install\$3)

0   L3

DB=PGPB,USPT,USOC; PLUR=YES; OP=OR

L2   L1 same (insert\$3 or install\$3)

64   L2

L1   (removable or replacable or extractable) same expansion same (module or unit) same portable

150   L1

END OF SEARCH HISTORY

Start EAST - [...]



**EAST - [Untitled1:1]**

File View Edit Tools Window Help

☐ Drafts  
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     L1: (68) (removable or  
     L2: (21) 11 and adapter  
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11 and adapter

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	U	1	Document ID	Issue Dat	Pages	Title	Current OR	Current X ▲
1	<input type="checkbox"/>	<input type="checkbox"/>	US 6863557 B2	20050308	51	High-density removable expansion module having	439/377	439/76.1; 439/946
2	<input type="checkbox"/>	<input type="checkbox"/>	US 6862617 B1	20050301	16	System and method for synchronizing objects b	709/224	707/201; 709/225
3	<input type="checkbox"/>	<input type="checkbox"/>	US 6691196 B2	20040210	24	First-level removable module having bar code	710/301	361/684; 361/686;
4	<input type="checkbox"/>	<input type="checkbox"/>	US 6683584 B2	20040127	89	Camera display system	345/8	359/630
5	<input type="checkbox"/>	<input type="checkbox"/>	US 6599194 B1	20030729	35	Home video game system with hard disk drive an	463/30	463/42; 463/43
6	<input type="checkbox"/>	<input type="checkbox"/>	US 6599147 B1	20030729	48	High-density removable expansion module having	439/377	439/76.1; 439/946
7	<input type="checkbox"/>	<input type="checkbox"/>	US 6525932 B1	20030225	39	Expansion unit and electronic apparatus	361/686	235/430; 312/223.2
8	<input type="checkbox"/>	<input type="checkbox"/>	US 6442570 B1	20020827	14	Object identification and data communication	707/201	707/10; 707/104.1
9	<input type="checkbox"/>	<input type="checkbox"/>	US 6421031 B1	20020716	89	Camera display system	345/8	359/630
10	<input type="checkbox"/>	<input type="checkbox"/>	US 6385468 B2	20020507	20	External connector and battery extension pack	455/572	455/90.1
11	<input type="checkbox"/>	<input type="checkbox"/>	US 6088620	20000711	21	Computer system in	700/16	713/310;



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Results for "( expansion module&lt;in&gt;metadata )"

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Key

IEEE JNL IEEE Journal or Magazine

IEEE JNL IEEE Journal or Magazine

IEEE CNF IEEE Conference Proceeding

IEEE CNF IEEE Conference Proceeding

IEEE STD IEEE Standard

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Citation



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Article Information

**1. A 160-Gb/s ATM switch prototype using the concentrator-based growable switch architecture**

Eng, K.Y.; Karol, M.J.; Cyr, G.J.; Pashan, M.A.;  
Communications, 1995. ICC 95 Seattle, Gateway to Globalization, 1995 IEEE International Conference on  
Volume 1, 18-22 June 1995 Page(s):550 - 554 vol.1

[AbstractPlus](#) | Full Text: [PDF\(360 KB\)](#) IEEE CNF
**2. A 533 MBits/sec/wire modular bus with single or double parallel termination**

Nimmagadda, S.; Dillon, J.; Moncayo, A.;  
Electronic Components and Technology Conference, 1996. Proceedings., 46th  
28-31 May 1996 Page(s):974 - 983

[AbstractPlus](#) | Full Text: [PDF\(1140 KB\)](#) IEEE CNF
**3. Experimental research on a hot swappable bus system**

Yamada, T.; Kaminaga, Y.; Kurosawa, K.; Ohashi, A.; Masui, K.;  
American Control Conference, 1997. Proceedings of the 1997  
Volume 1, 4-6 June 1997 Page(s):213 - 217 vol.1

[AbstractPlus](#) | Full Text: [PDF\(500 KB\)](#) IEEE CNF
**4. IEEE standard specifications for an I/O expansion bus: SBX bus**

IEEE Std 959-1988  
21 Dec. 1988

[AbstractPlus](#) | Full Text: [PDF\(1904 KB\)](#) IEEE STD

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## IEEE standard specifications for an I/O expansion bus: SBX bus

Technical Committee on Microprocessors and Microcomputers of the IEEE Computer Society, USA

This paper appears in: **IEEE Std 959-1988**

Publication Date: 21 Dec. 1988

INSPEC Accession Number: 3371004

Posted online: 2002-08-06 16:01:29.0

## Abstract

The IEEE 959 I/O expansion bus concept allows low-cost, highly flexible I/O expansion for computer boards. The specification describes the elements of the bus system, the bus interface signals, and the bus operations. The electrical considerations required for the bus include the following: logical and electrical state relationships, environmental considerations, power supply specifications, signal line characteristics, timing specifications, and driver/receiver specifications. The specification describes the physical and mechanical specifications that a designer must be concerned with when designing a baseboard or an expansion module compatible with the IEEE 959 I/O expansion bus. It specifies the requirements of a miniature two-piece stacking connector to be used in both the 8- and 16-bit versions of the IEEE 959 I/O expansion bus. Finally, it presents the concept and notation of levels of compliance.<>

## Index Terms

## Inspec

## Controlled Indexing

[computer interfaces](#) [standards](#)

## Non-controlled Indexing

[I/O expansion](#) [IEEE 959 I/O expansion bus](#) [SDX bus](#) [baseboard](#) [bus interface signals](#) [bus operations](#) [computer boards](#) [driver/receiver specifications](#) [levels of compliance](#) [power supply](#) [signal line characteristics](#) [state relationships](#) [timing specifications](#) [two-piece stacking connector](#)

## Author Keywords

Not Available

## References

No references available on IEEE Xplore.

## Citing Documents

No citing documents available on IEEE Xplore.

# Hit List

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## Search Results - Record(s) 1 through 10 of 14 returned.

☐ 1. Document ID: US 20040062001 A1

L5: Entry 1 of 14

File: PGPB

Apr 1, 2004

PGPUB-DOCUMENT-NUMBER: 20040062001

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040062001 A1

TITLE: WOOFER MODULE OF A PORTABLE COMPUTER

PUBLICATION-DATE: April 1, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Chang, Hung-Yue	Taipei Hsien		TW	
Tsai, Chu-Chia	Taipei Hsien		TW	
Chu, Shu-Hsien	Taipei Hsien		TW	
Li, Chien-Te	Taipei Hsien		TW	
Chen, Wen-Chi	Taipei Hsien		TW	
Chen, Jin-Ming	Taipei Hsien		TW	
Huang, Sung-Chan	Taipei Hsien		TW	
Li, Tung-Yang	Taipei Hsien		TW	

US-CL-CURRENT: 361/686

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw Desc	Image
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☐ 2. Document ID: US 20020131234 A1

L5: Entry 2 of 14

File: PGPB

Sep 19, 2002

PGPUB-DOCUMENT-NUMBER: 20020131234

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020131234 A1

TITLE: Portable computer docking station with protected connector

PUBLICATION-DATE: September 19, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Sterner, John R	Albany	OR	US	
Singleton, Charles W. JR.	Corvallis	OR	US	

US-CL-CURRENT: 361/686

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KM/C	Draw Desc	Image
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☐ 3. Document ID: US 20020078291 A1

L5: Entry 3 of 14

File: PGPB

Jun 20, 2002

PGPUB-DOCUMENT-NUMBER: 20020078291

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020078291 A1

TITLE: Portable pen-based computer with vehicular docking station

PUBLICATION-DATE: June 20, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Sutton, John	Hurst	TX	US	
Swindler, Danny E.	Austin	TX	US	
Groh, Brian	Glen Morris	TX	CA	
Perley, Richard	Oakville		CA	
Clifton, Glen	Austin		US	

US-CL-CURRENT: 710/302

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KM/C	Draw Desc	Image
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☐ 4. Document ID: US 6798654 B2

L5: Entry 4 of 14

File: USPT

Sep 28, 2004

US-PAT-NO: 6798654

DOCUMENT-IDENTIFIER: US 6798654 B2

TITLE: Woofer module of a portable computer

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KM/C	Draw Desc	Image
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☐ 5. Document ID: US 6549416 B2

L5: Entry 5 of 14

File: USPT

Apr 15, 2003

US-PAT-NO: 6549416

DOCUMENT-IDENTIFIER: US 6549416 B2

**\*\* See image for Certificate of Correction \*\***

TITLE: Portable computer docking station with protected connector

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KM/C	Draw Desc	Image
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☐ 6. Document ID: US 6504710 B2

L5: Entry 6 of 14

File: USPT

Jan 7, 2003

US-PAT-NO: 6504710

DOCUMENT-IDENTIFIER: US 6504710 B2

TITLE: Method of interconnecting of a hand-held auxiliary unit, a portable computer and a peripheral device

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMMC	Draw Desc	Image
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☐ 7. Document ID: US 6426872 B1

L5: Entry 7 of 14

File: USPT

Jul 30, 2002

US-PAT-NO: 6426872

DOCUMENT-IDENTIFIER: US 6426872 B1

TITLE: Portable pen-based computer with vehicular docking station

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMMC	Draw Desc	Image
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☐ 8. Document ID: US 6208509 B1

L5: Entry 8 of 14

File: USPT

Mar 27, 2001

US-PAT-NO: 6208509

DOCUMENT-IDENTIFIER: US 6208509 B1

TITLE: Portable computer having access door

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMMC	Draw Desc	Image
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☐ 9. Document ID: US 6101087 A

L5: Entry 9 of 14

File: USPT

Aug 8, 2000

US-PAT-NO: 6101087

DOCUMENT-IDENTIFIER: US 6101087 A

TITLE: Portable pen-based computer and auxiliary unit for use with a vehicular docking station

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMMC	Draw Desc	Image
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☐ 10. Document ID: US 6011687 A

L5: Entry 10 of 14

File: USPT

Jan 4, 2000

US-PAT-NO: 6011687

DOCUMENT-IDENTIFIER: US 6011687 A

\*\* See image for Certificate of Correction \*\*

TITLE: Docking station adapter for computer media modules

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMMC	Draw Desc	Image
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Terms	Documents
L2 and L4	14

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Search Results - Record(s) 11 through 14 of 14 returned.

☐ 11. Document ID: US 5883820 A

L5: Entry 11 of 14

File: USPT

Mar 16, 1999

US-PAT-NO: 5883820

DOCUMENT-IDENTIFIER: US 5883820 A

TITLE: Computer system

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMOC	Draw Desc	Image
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☐ 12. Document ID: US 4926365 A

L5: Entry 12 of 14

File: USPT

May 15, 1990

US-PAT-NO: 4926365

DOCUMENT-IDENTIFIER: US 4926365 A

TITLE: Portable computer system

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMOC	Draw Desc	Image
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☐ 13. Document ID: US 4903222 A

L5: Entry 13 of 14

File: USPT

Feb 20, 1990

US-PAT-NO: 4903222

DOCUMENT-IDENTIFIER: US 4903222 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Arrangement of components in a laptop computer system

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMOC	Draw Desc	Image
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☐ 14. Document ID: US 4894792 A

L5: Entry 14 of 14

File: USPT

Jan 16, 1990

US-PAT-NO: 4894792

DOCUMENT-IDENTIFIER: US 4894792 A

TITLE: Portable computer with removable and replaceable add-on modules

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMOC	Draw Desc	Image
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Terms	Documents
L2 and L4	14

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L5: Entry 11 of 14

File: USPT

Mar 16, 1999

US-PAT-NO: 5883820

DOCUMENT-IDENTIFIER: US 5883820 A

TITLE: Computer system

DATE-ISSUED: March 16, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ota; Hiroichi	Tokyo			JP
Ono; Shingo	Higashimurayama			JP

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Citizen Watch Co., Ltd.	Tokyo			JP	03

APPL-NO: 08/ 870701 [\[PALM\]](#)

DATE FILED: June 6, 1997

## PARENT-CASE:

This application is a continuation of application Ser. No. 08/371,560 filed Jan. 11, 1995 now abandoned.

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
JP	6-014111	January 13, 1994

INT-CL: [06] [G06 F 1/16](#)

US-CL-ISSUED: 364/708.1

US-CL-CURRENT: [361/683](#)

FIELD-OF-SEARCH: 364/704, 364/705.01, 364/705.06, 364/708.01, 364/710.01, 364/710.13, 361/680, 361/683, 361/684, 361/685, 361/686, 361/687

## PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<a href="#">4736332</a>	April 1988	Crease	364/708.1
<input type="checkbox"/>	<a href="#">4769764</a>	September 1988	Leavnon	361/680
<input type="checkbox"/>	<a href="#">4788658</a>	November 1988	Hanebuth	361/684
<input type="checkbox"/>	<a href="#">4790431</a>	December 1988	Reel et al.	312/223.2

<input type="checkbox"/> . 4837590	June 1989	Sprague	346/145
<input type="checkbox"/> 4896776	January 1990	Kabanuk et al.	202/576
<input type="checkbox"/> 4903222	February 1990	Carter et al.	361/680
<input type="checkbox"/> 4978949	December 1990	Herron et al.	345/168
<input type="checkbox"/> 5010988	April 1991	Brown	190/104
<input type="checkbox"/> 5030128	July 1991	Herron et al.	439/372
<input type="checkbox"/> 5058045	October 1991	Ma	361/683
<input type="checkbox"/> 5105338	April 1992	Held	361/683
<input type="checkbox"/> 5107401	April 1992	Youn	361/683
<input type="checkbox"/> 5187645	February 1993	Spalding et al.	361/393
<input type="checkbox"/> 5212628	May 1993	Bradbury	361/683
<input type="checkbox"/> 5227953	July 1993	Lindberg et al.	361/686
<input type="checkbox"/> 5242056	September 1993	Zia et al.	206/576
<input type="checkbox"/> 5251105	October 1993	Kobayashi et al.	361/683

## FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
62-162723	October 1987	JP	
2-149437	December 1990	JP	
3-121427	December 1991	JP	
5-12154	February 1993	JP	
5-20132	March 1993	JP	
5-16336	March 1993	JP	
5-40938	June 1993	JP	
5-204539	August 1993	JP	
5-66726	September 1993	JP	
5-87620	November 1993	JP	

ART-UNIT: 277

PRIMARY-EXAMINER: Ngo; Chuong Dinh

ATTY-AGENT-FIRM: McDermott, Will &amp; Emery

## ABSTRACT:

In a computer system comprising a portable computer 100 of a substantially rectangular shape having at least a first side portion 101 and a second side portion 102 and peripheral apparatuses 200 and 300 connectable thereto, the area of the portable computer is at least 182.times.257 mm or less and 140.times.216 mm or more, and among the peripheral apparatuses, the first peripheral apparatus 200 is attached to the first side portion 101 of the portable computer 100 while the second peripheral apparatus 300 is attached to the second side portion 102 of the portable computer 100, and outer dimensions A and B of the computer system, to the side portions of which the peripheral apparatuses 200 and 300 are attached, are approximately equal to those of American letter size paper, whereby the computer system and documents of American letter size can be stored side-by-side in an American letter size carrying case.

18 Claims, 24 Drawing figures

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L5: Entry 12 of 14

File: USPT

May 15, 1990

US-PAT-NO: 4926365

DOCUMENT-IDENTIFIER: US 4926365 A

TITLE: Portable computer system

DATE-ISSUED: May 15, 1990

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hsieh; Lai-Fa	Taipei			TW

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Great Electronics Corporation	Taipei			TW	03

APPL-NO: 07/ 236836 [\[PALM\]](#)

DATE FILED: August 26, 1988

INT-CL: [05] G06F 1/00

US-CL-ISSUED: 364/708

US-CL-CURRENT: [361/683](#); [361/680](#), [361/681](#), [D18/52](#)

FIELD-OF-SEARCH: 364/708, 361/394, 361/391, 361/413, 361/380

PRIOR-ART-DISCLOSED:

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[Search Selected](#) [Search All](#) [Clear](#)

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
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<input type="checkbox"/> <a href="#">4742478</a>	May 1988	Nigro, Jr. et al.	364/708
<input type="checkbox"/> <a href="#">4769764</a>	September 1988	Revanon	364/708

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vol. 29, #10, pp. 4273-4274, Mar. 1987.

ART-UNIT: 231

PRIMARY-EXAMINER: Harkcom; Gary V.

ASSISTANT-EXAMINER: Shaw; Dale M.

ATTY-AGENT-FIRM: Rosenberg; Morton J. Klein; David I.

ABSTRACT:

A portable computer system (1) including a central processing unit contained within a main housing and includes a keyboard (15), display screen (12), floppy disk driver (9) and a hard disk driver (10). A forked crevice fixed pin base (3) couples cover (11) to the main housing of portable computer system (1) by releasable securement of a screen connector plate (16) and a computer connector insert member (2). A locking mechanism (13) is provided on the cover for interface with the main housing of the portable computer system (1) to provide a compact overall closed system having a handle (5) which allows portability by a user. A battery box (4) is insertable and removable from the main housing of the portable computer system (1). A replaceable hard disk drive (10) is insertable with a recess formed within the main housing of portable computer system (1) to allow insert and removability therefrom. A number of expansion systems such as a RAM board (8), a modem (7), and circuit boards (6) are provided for insert and removability from portable computer system (1).

4 Claims, 10 Drawing figures

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L5: Entry 14 of 14

File: USPT

Jan 16, 1990

US-PAT-NO: 4894792

DOCUMENT-IDENTIFIER: US 4894792 A

TITLE: Portable computer with removable and replaceable add-on modules

DATE-ISSUED: January 16, 1990

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mitchell; Dennis R.	San Jose	CA		
Molenda; James R.	Fremont	CA		
Nakamura; Karl S.	Palo Alto	CA		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Tandy Corporation	Fort Worth	TX			02

APPL-NO: 07/ 252177 [\[PALM\]](#)

DATE FILED: September 30, 1988

INT-CL: [04] G06F 1/00

US-CL-ISSUED: 364/708

US-CL-CURRENT: [361/684](#); [361/680](#), [361/681](#)

FIELD-OF-SEARCH: 364/708, 361/393, 361/394, D14/100, D14/106

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

☐ Search Selected☐ Search ALL☐ Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
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<input type="checkbox"/>	<a href="#">4571456</a>	February 1986	Paulsen et al.	364/708 X
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<input type="checkbox"/>	<a href="#">4715385</a>	December 1987	Cudahy et al.	364/708 X

ART-UNIT: 231

PRIMARY-EXAMINER: Clark; David L.

ASSISTANT-EXAMINER: Mai; Tan V.

ATTY-AGENT-FIRM: Feix; Donald C.

ABSTRACT:

A portable computer is constructed to utilize bottom add-on expansion modules, battery tray compartment plug-in modules and mass storage plug-in drawer modules. The modules permit the operating capabilities of the portable computer to be readily altered as desired or as needed at a given location or for a particular job function and do not require redesign or alteration of the internal components of the portable computer as modules are added or changed. Each module construction includes direct plug-in connectors which permit the add-on module to be directly connected to the computer bus without any cabling between the computer and the added module. The construction of the add-on modules permits the computer to be operated as a stand alone computer without any add-on modules and permits the computer to be operated as a portable computer powered by a battery. The construction also permits a wide variety of function cards, mass storage devices, communication devices, interface display devices, interface to instrumentation interfaces, interfaces to small servers (and any other part that can pick up the computer bus) to be readily associated with the portable computer.

11 Claims, 7 Drawing figures

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L5: Entry 8 of 14

File: USPT

Mar 27, 2001

US-PAT-NO: 6208509

DOCUMENT-IDENTIFIER: US 6208509 B1

TITLE: Portable computer having access door

DATE-ISSUED: March 27, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cha; Jung-Woo	Kyunggi-do			KR

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Samsung Electronics Co., Ltd.	Kyungki-do			KR	03

APPL-NO: 09/ 453570 [\[PALM\]](#)

DATE FILED: December 2, 1999

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
KR	98-23881	December 2, 1998

INT-CL: [07] [H05](#) [K](#) [5/00](#)

US-CL-ISSUED: 361/686; 361/687, 361/725, 360/97.01, 312/332.1

US-CL-CURRENT: [361/686](#); [312/332.1](#), [360/97.01](#), [361/687](#), [361/725](#)

FIELD-OF-SEARCH: 361/686, 361/683, 361/687, 361/724-727, 360/97.01, 360/98.01, 312/332.1, 312/333

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

[Search Selected](#) [Search ALL](#) [Clear](#)

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
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ART-UNIT: 285

PRIMARY-EXAMINER: Picard; Leo P.

ASSISTANT-EXAMINER: Duong; Hung Van

ATTY-AGENT-FIRM: Bushnell, Esq.; Robert E.

## ABSTRACT:

The present invention relates to a portable computer having an access door. The portable computer has a housing having a surface with an opening. At least one slot is formed on the surface having the opening. A door is coupled to the housing from the outside and the housing has at least one pin inserted into the housing through a slot. A washer is coupled to the pin. The washer is combined with a pin within the housing to enable the door to be moved horizontally along the slot. A spring is mounted on the surface corresponding to the slot. The spring provides the door with an elastic force when the door is moved horizontally along the slots.

16 Claims, 10 Drawing figures

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US006863557B2

(12) **United States Patent**  
Mills et al.

(10) Patent No.: **US 6,863,557 B2**  
(45) Date of Patent: **Mar. 8, 2005**

(54) **HIGH-DENSITY REMOVABLE EXPANSION MODULE HAVING I/O AND SECOND-LEVEL-REMOVABLE EXPANSION MEMORY**

(75) Inventors: **Kerby J. Mills, Palo Alto, CA (US); Michael L. Gifford, San Leandro, CA (US)**

(73) Assignee: **Socket Communications, Inc., Newark, CA (US)**

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/449,867**

(22) Filed: **May 30, 2003**

(65) **Prior Publication Data**

US 2004/0048503 A1 Mar. 11, 2004

#### Related U.S. Application Data

(63) Continuation of application No. 09/439,966, filed on Nov. 12, 1999, now Pat. No. 6,599,147, which is a continuation-in-part of application No. 09/309,373, filed on Mar. 11, 1999, now Pat. No. 6,353,870.

(51) Int. Cl.<sup>7</sup> ..... **H01R 13/64**  
(52) U.S. Cl. .... **439/377; 439/946; 439/76.1**  
(58) Field of Search ..... **439/377, 946, 439/76.1, 74, 73; 361/737, 752, 796, 683**

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Primary Examiner—Gary Patmen

Assistant Examiner—Edwin A. Leon

(74) Attorney, Agent, or Firm—Patent Ventures, Bennett Smith, Korthin Via Dyke

#### (57) ABSTRACT

The utility of portable computer hosts, such as PDAs (or hand-helds), is enhanced by methods and apparatus for removable expansion cards having application specific circuitry, a second-level-removable memory, and optional I/O, in a number of illustrative embodiments. In addition to providing greater expansion utility in a compact and low profile industrial design, the present invention permits memory configuration versatility for application specific expansion cards, permitting easy user field selection and upgrades of the memory used in conjunction with the expansion card. Finally, from a system perspective, the present invention enables increased parallelism and functionality previously not available to portable computer devices.

34 Claims, 37 Drawing Sheets



US006691196B2

(12) **United States Patent**  
Mills et al.

(10) Patent No.: **US 6,691,196 B2**  
(45) Date of Patent: **\*Feb. 10, 2004**

(54) **FIRST-LEVEL REMOVABLE MODULE  
HAVING BAR CODE I/O AND  
SECOND-LEVEL REMOVABLE MEMORY**

5,550,709 A 8/1996 Iwasaki 361/684

(List continued on next page.)

**OTHER PUBLICATIONS**

(75) Inventors: Kevin J. Mills, Palo Alto, CA (US);  
Michael L. Gifford, San Leandro, CA (US)

(73) Assignee: Socket Communications, Inc., Newark, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: 10/036,468

(22) Filed: Jan. 7, 2002

(65) **Prior Publication Data**

US 2002/0169912 A1 Nov. 14, 2002

**Related U.S. Application Data**

(63) Continuation of application No. 09/309,373, filed on May 11, 1999, now Pat. No. 6,353,875.

(51) Int. Cl.<sup>7</sup> G06F 13/00; G06F 1/16

(52) U.S. Cl. 710/301; 710/2; 711/115;  
361/684; 361/686

(58) Field of Search 710/300-304,  
710/2; 361/679-686; 711/115

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*SanDisk MultiMediaCard*, SanDisk Corporation, Nov. 1997.  
Apr. 30, 2001 PCT Written Opinion for related International application No. PCT/US00/12796, filed May 9, 2000.

*Primary Examiner*—Sumali Lefkowitz

(74) *Attorney, Agent, or Firm*—Patent Ventures, Bennett Smith, Korbin Van Dyke

(57) **ABSTRACT**

Computer hosts, such as PDAs, are customized for use in bar code scanner applications through use of a first-level removable expansion module having bar code related circuitry and a slot and internal connector for a second-level removable memory. In combination with a connected or attached I/O device for scanning bar codes, these modules provide embedded bar code scanning I/O adapter and/or application-specific functions as well as second-level removable memory functions. The removable memory may be used to store a backup copy of the scanned data for restoration in the event the original scan data is lost or corrupted. Restoration may occur using any interface compatible with the removable memory. The removable memory may also be used by the bar code scanner application specific circuitry within the first-level removable expansion module. In illustrative embodiments, an industry standard physical and electrical interface couples the application specific module to the computer host, which provides user interface functions for the application.



US006599147B1

(12) **United States Patent**  
Mills et al.(10) Patent No.: **US 6,599,147 B1**  
(45) Date of Patent: **Jul. 29, 2003**(54) **HIGH-DENSITY REMOVABLE EXPANSION MODULE HAVING I/O AND SECOND-LEVEL-REMOVABLE EXPANSION MEMORY**

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**OTHER PUBLICATIONS**(75) Inventors: Kevin J. Mills, Palo Alto, CA (US);  
Michael L. Gifford, San Leandro, CA (US)*MultiMediaCard System Summary Version 2.0*, MMCA, Jan. 1999.

(73) Assignee: Socket Communications, Inc., Newark, CA (US)

Wes Brewer, *Smart Solutions for Smart Phones*, SanDisk Corporation, 1998.

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

*CompactFlash Specification Revision 1.3* CompactFlash Association, 1998.

(21) Appl. No.: 09/439,966

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(22) Filed: Nov. 12, 1999

*SanDisk CompactFlash*, SanDisk Corporation, Apr. 1998.*SanDisk MultiMediaCard*, SanDisk Corporation, Nov. 1997.

Apr. 30, 2001 PCT Written Opinion for related International application No. PCT/US00/12796, filed May 9, 2000.

**Related U.S. Application Data**

\* cited by examiner

(63) Continuation-in-part of applications No. 05/309,373, filed on May 11, 1999, now Pat. No. 6,353,870.

*Primary Examiner*—F. Austin Bradley*Assistant Examiner*—Edwin A. León(51) Int. Cl.<sup>7</sup> ..... H01R 13/64

(74) Attorney, Agent, or Firm—Parent/Vernieres, Bennett Smith, Kozbin-Van Dyke

(52) U.S. Cl. .... 439/377; 439/946; 439/76.1

(58) Field of Search ..... 439/377, 946, 439/74, 75, 76.1; 361/737, 752, 796, 683

**ABSTRACT****References Cited****U.S. PATENT DOCUMENTS**

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5,550,709 A	8/1996	Iwasaki	361/684
5,563,400 A	10/1996	Le Roux	235/486
5,566,290 A	10/1996	Silverbrook	395/173
5,579,430 A	11/1996	Güll et al.	395/212
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The utility of portable computer hosts, such as PDAs (or handhelds), is enhanced by methods and apparatus for removable expansion cards having application specific circuitry, a second-level-removable memory, and optional I/O, in a number of illustrative embodiments. In addition to providing greater expansion utility in a compact and low profile industrial design, the present invention permits memory configuration versatility for application specific expansion cards, permitting easy user field selection and upgrades of the memory used in conjunction with the expansion card. Finally, from a system perspective, the present invention enables increased parallelism and functionality previously not available to portable computer devices.

36 Claims, 37 Drawing Sheets